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INSPECTION CHECKLIST

EPA Region II
TES II Work Assignment No. 563
PRC Environmental Management, Inc.

General Information

Facility Name:	Eli Lilly Industries, Inc.
Facility EPA I.D. Number:	PRD 09 102 4786
NPDES Permit No.:	PR0000353
Inspection Date:	April 27, 1987
Inspectors:	Susan J. Burns Brian Kaplan
Facility Primary Contact:	Jose Rivera
Primary Contact Telephone Number:	(809) 834-7846
Facility Representatives:	(1) Jose Rivera, Engineering Manager (2) Gabriel Garcia, Project Engineer
Facility Mailing Address:	P.O. Box 1748 Mayaguez, Puerto Rico 00709
Facility Location:	State Rd. No. 2, Km 146.7 Mayaguez, Puerto Rico 00708

TANKS VS SURFACE IMPOUNDMENTS
INSPECTION REPORT
ELI LILLY INDUSTRIES, INC. (MAYAGUEZ)

INTRODUCTION

On Monday, April 27, 1987, PRC inspectors, Susan Burns and Brian Kaplan, inspected the Eli Lilly Industries, Inc., facility in Mayaguez, Puerto Rico. PRC met with Eli Lilly representatives Jose J. Rivera, Engineering Manager, and Gabriel Garcia, Project Engineer. The inspection consisted of an interview and an escorted tour of the facility.

The Eli Lilly Industries facility in Mayaguez, Puerto Rico, is one of 35 facilities in Puerto Rico investigated under TES 2 Work Assignment No. 563. Under this work assignment, U.S. EPA requested that PRC determine if any of the 35 facilities operated a wastewater treatment plant (WWTP) with a unit subject to RCRA regulations. A WWTP unit is subject to RCRA regulations if it (1) is a surface impoundment and (2) handles hazardous waste. U.S. EPA requested each of the 35 facilities to respond to a questionnaire relating to its WWTP. After reviewing the responses, PRC recommended that certain facilities be inspected, including the Eli Lilly facility in Mayaguez.

Documents used as references in this report are referenced by number and are attached.

INSPECTION OBJECTIVE

Eli Lilly Industries, Inc. stated that its WWTP consisted of a series of lagoons and two tanks that collect waste (1). One tank holds acidic waste and the other holds basic wastes. These wastes are then added to a neutralization lagoon. PRC recommended that this facility be inspected because the neutralization lagoon could be considered a RCRA-regulated unit, depending on the pH values of the incoming waste streams and where and when neutralization occurs within the lagoon (see 40 CFR 265.90e).

PRC's primary objectives in inspecting this facility were to:

- Visually inspect the WWTP
- Determine the pH values of the two waste streams entering the neutralization lagoon
- Determine where and when neutralization occurs

Two secondary objectives were to:

- Determine the nature of the facility's business
- Identify and inspect all hazardous waste units

FINDINGS - PRIMARY OBJECTIVES

As a result of the inspection, PRC determined that the Eli Lilly Industries facility in Mayaguez operates a WWTP which is exempt from RCRA permitting regulations. This determination is based on the facilities claim that the wastewater does not contain RCRA-listed hazardous waste and the lagoons may meet the definition of a tank. (At the time of the inspection, the facility could not provide construction diagrams to give enough detailed information to make this determination.)

This facility's WWTP consists of two tanks, one for acidic and one for basic waste, a "neutralization lagoon," an "equalization lagoon," an "oxidation lagoon," a "dilution lagoon," a clarifier, and a chlorination unit (see Figures 1 and 2). The facility has an NPDES permit and discharges to a nearby river (3). Sludge generated from the clarifier is dewatered and disposed of in a sanitary landfill. An analysis of the sludge, after drying, was provided by the facility and showed the following concentrations of solvents:

Acetone	0.45 mg/kg
Ethyl Ether	<0.04 mg/kg
Toluene	<0.04 mg/kg
Ethyl Acetate	<0.10 mg/kg

During the inspection, PRC found that the neutralization lagoon is actually an in-ground tank constructed of 8-inch concrete with steel reinforcement and an acid-resistant coating. Construction drawings were not available at the time of the inspection; however, it receives two waste streams: (1) an acid waste stream (with a pH sometimes less than 2.0 and (2) a caustic waste stream (with pH values sometimes greater than 12.5). This lagoon is aerated and the two waste streams enter the lagoon at points adjacent to one another where they are mixed. A probe monitors the pH in the lagoon, and acid or caustic is added automatically to neutralize the wastewater.

From the neutralization lagoon, the wastewater travels to the equalization lagoon and next to the oxidation lagoon. Both of these units are aboveground tanks with earthen dikes and 8-inch thick concrete walls (at 45 degree angles). Stormwater is collected in the dilution lagoon and is added to the oxidation lagoon as needed to maintain proper biological activity. The dilution lagoon is in-ground and has a synthetic liner and earthen dikes.

The WWTP receives equipment wash water, scrubber discharge, boiler blowdown, cooling tower blowdown, and ion exchange regenerant. Figure 3 shows a detailed flow diagram of the sources of the wastewater. This figure describes the different buildings (referenced as PM), the different products that are produced, and the sources of wastewater from each process. For instance, building PM-3 produces propoxyphene hydrochloride with caustic water, dryer blender trap, and other wastes going to the WWTP and ethyl acetate residue going to the incinerator. According to the facility's questionnaire response and conversations with facility representatives, the water entering the WWTP contains acetone, ethyl acetate, hexane, dimethyl amine, methyl alcohol, ethyl alcohol, amyl acetate, and possibly other wastes.

FINDINGS - SECONDARY OBJECTIVES

Facility Background

This Eli Lilly facility manufactures the following pharmaceutical products:

- Darvon
- Keaflex
- Iloson
- Dymelor

The facility has RCRA interim status and is in the process of having its Part B permit application reviewed (2, 4).

Hazardous Waste Units

The facility representative identified the following hazardous waste units in operation at this site:

- Five hazardous waste storage tanks -- These aboveground tanks are used to store hazardous wastes before they are incinerated.

- Incinerator -- This incinerator treats hazardous waste from this plant and other Eli Lilly plants in Puerto Rico.

- Drum storage -- The drum storage area appeared to be well maintained, and all the drums looked fairly new (no rust). However, the inspectors noticed that one drum was leaking. A small amount of liquid waste was seen around the edge of the drum on the concrete floor.

SUMMARY

As a result of this inspection, PRC determined that the Eli Lilly Industries facility in Mayaguez operates a WWTP which is exempt from RCRA permitting regulations. This determination is based on the facilities claim that the wastewater after neutralization does not contain RCRA-listed hazardous waste. However, at the time this report was written, PRC could not complete analysis on the equalization or oxidation lagoon to determine if the lagoons are defined by RCRA as a tank or surface impoundment because the construction drawings were not available. If the lagoons are classified as a surface impoundment, an analysis of the wastewater should be completed to verify that the wastewater is not hazardous. If the lagoons are classified as tanks, the analysis is not necessary.

QUESTIONNAIRE

Facility I.D. Number: PRD 091024786

Facility Name: ELI LILLY INDUSTRIES, INC.

Facility Contact (Name and Title): JOSE JUAN RIVERA

Facility Contact (Phone): 834-7846

Facility Mailing Address:

(Street) P.O. BOX 1748

(City) MAYAGUEZ

(State) PUERTO RICO (Zip) 00709

Facility Location:

(Street) STATE ROAD NO. 2 KM 146.7

(City) MAYAGUEZ

(County) ---

(State) PUERTO RICO (Zip) 00709

1. **Is this wastewater treatment plant (WWTP) a package treatment plant?**

   Yes ____

   No X

   Yes - **Write the name of manufacturer, model, and number in the space below.**

   _____

   No - **Continue to next question.**

2. **Is this WWTP active or inactive?**

   Active X

   Inactive ____

Describe the WWTP facility including the following: (SEE ANNEX I)

a) Plant design capacity

b) Components of treatment plant (activated sludge, sedimentation, post aeration, etc.)

c) If the treatment unit is a tank, provide: (SEE ANNEX II)

i) Average and maximum flows

ii) Tank design criteria including design, capacity, number and size of tank, etc.

iii) Tank wall construction material and thickness (For example, 3/8" steel)

iv) Type of tank (above-ground, below-ground, semi-above ground)

4. Does the influent wastestream to this WWTP contain regulated hazardous wastes as defined in 40 CFR 261.3?

Yes ____

No X

Yes - Describe the type of hazardous waste (Including EPA hazardous waste no.).

No - Describe the influent waste characteristics. (SEE ANNEX III)

5. Does this WWTP generate hazardous waste sludge?

Yes ____

No X

Describe the type of sludge, the treatment unit where the sludge is generated and how the sludge is handled for disposal. SEE ANNEX IV

6. Does this WWTP contain a surface impoundment (pond, lagoon, pit, etc.)?

Yes X

No ____

Submit the following information:

a) **Site location map** (SEE ANNEX V)

b) **WWTP lay-out** (SEE ANNEX VI)

c) **Treatment facility schematic flow diagram** (SEE ANNEX VI)

3. Description of Waste Water Treatment Plant

The Waste Water Treatment Plant of Eli Lilly Industries, Inc., in Mayaguez, is a secondary treatment plant with a capacity to treat 4000 lbs. COD per day. It can handle a volume of 108,000 gallons of water per day.

The waste is collected in two concrete holding tanks (10,000 gallons each). One of the tanks stores the acid wastes while the other holds caustic wastes. Neutralization is accomplished continuously, either by adding acid or caustic in the neutralization lagoon. Then the waste water is pumped to an equalization lagoon of 150,000 gallons capacity. Mixing and Areation are performed by flotating agitators. Biological Oxidation is carried out in a 190,000 gallons oxidation lagoon furnished with two rotors, that provides the necessary oxygen to make an aerobic media. In the oxidation lagoon 95% of the organic load coming from equalization lagoon is oxidated. Part of the load is converted in suspended solids that are removed in the clarifier (28 gallons capacity). The stream from the bottom of the clarifier is returned to the oxidation lagoon to maintain a proper level of bacterias. Periodically, solids are discarded from the oxidation lagoon and are filtrated in a dewatering machine. The effluent from the clarifier is treated with chlorine for disinfection.

Sanitary waste are pumped to the oxidation lagoon to be treated with the process water. Blowdown of incinerator cooling tower and storm water are mixed with the clarifier discharge stream. All these flows are then mixed before discharging it to the river.

Sampling and Monitoring is accomplished, according to the NPDES permit requirement.

3.C) 1. Concrete Holding Tanks (2)

a) Volume 10,000 gallons
b) Above ground
c) Wall thickness 6" (Armored Concrete 3000 psi)
d) Flow maximum through tank 28,800 gals/day

2. Clarifier (1)

a) Volume 28,000 gallons
b) Above ground
c) Constructed in steel (3/8" wall thickness)
d) Maximum flow permissible 108,000 gals/day

3. Thickener (1)

a) Volume 12,000 gallons
b) Above ground
c) Constructed in steel (5/16" wall thickness)
d) Maximum flow permissible (10,000 gals/day

4. High COD Storage Tank (1)

a) Volume 12,000 gallons
b) Above ground
c) Constructed in steel (3/8" average)
d) Maximum flow/day (5000 gallons)

The waste treated in the waste treatment plant is mainly, process wastes that does not contain more than 25,000 ppm of COD. The waste is composed of equipment wash water, scrubber discharges, blowdown of boilers and cooling tower and the regeneration of the ionic exchange equipments.

The influent characteristics are as follows:

- PH : 4-10
- COD : 2000-25,000 ppm
- BOD : 500-10,000 ppm
- Suspended Solids : 3000 ppm max.
- Total Dissolve Solids : 40,000 ppm max.

The COD load is due to the presence of one or more of the following organic solvents.

- Acetone
- Ethyl Acetate
- Hexane
- Dimethyl Amine
- Methyl Alcohol
- Ethyl Alcohol
- Amyl Acetate

5. The sludge generated at our plant is produced by the biological oxidation of the organic matter. The clarifier mixed liquors are filtrated in a dewatering machine. The sludge is filtrated and the solids are transferred to a hopper. When the hopper is full, the solids are hauled away by truck to the Mayaguez landfill facilities.